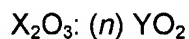**Claims**

1. A method for separating mono-branched hydrocarbons e.g. from a mixture of hydrocarbons comprising bringing said mixture into contact with at least one adsorbent, thereby allowing the selective adsorption of said mono-branched hydrocarbons by said adsorbent, and desorbing said mono-branched hydrocarbons from said adsorbent, thereby allowing to selectively separate said mono-branched hydrocarbons.

2. Method according to claim 1 for preferentially adsorbing said mono-branched hydrocarbons from a mixture of hydrocarbons.

3. Method for separating mixtures of hydrocarbons into fractions of linear, mono-branched and multi-branched hydrocarbons comprises the steps of:
   a. bringing said mixture into contact with at least one adsorbent, said adsorbent having a selectivity order from mono-branched to linear further to multi-branched hydrocarbons,
   b. separating a stream enriched in multi-branched hydrocarbons from said adsorbent, thereby allowing to separate said multi-branched hydrocarbons,
   c. desorbing the linear hydrocarbons from said adsorbent, thereby allowing to separate said linear hydrocarbons, and
   d. desorbing said mono-branched alkanes from said adsorbent, thereby allowing to separate said mono-branched hydrocarbons.

4. Method according to any of claims 1 to 3, wherein said hydrocarbons are alkanes.

5. Method according to any of claims 1 to 4, whereby said adsorbent is a zeolitic adsorbent.

6. Method according to any of claims 1 to 5, whereby said adsorbent is a zeolitic adsorbent having cavities of which the dimensions are larger than the pore openings

giving access to these cavities, these cavities having a smallest diameter of at least 4.5 Angström and a largest diameter of at least 10 Angström.

7. Method according to claim 6, whereby said cavities have a smallest diameter between 4.5 and 15 Angström, and a largest diameter between 10 and 25 Angström.

8. Method according to any of claims 1-7, whereby said zeolitic adsorbent comprises the molar relationship

$$X_2O_3: (n) \ YO_2$$

wherein n is at least 2, X is a trivalent element and Y is a tetravalent element.

9. Method according to claim 8, whereby n is at least 2, wherein X is selected from the group comprising aluminium, iron, gallium and boron and wherein Y is silicon.

10. Method according to claim 8 or 9, whereby n is at least 10, wherein X is aluminium, and wherein Y is silicon.

11. Method according to any of claims 1-10, whereby said zeolitic adsorbent is MCM-22.

12. Method according to any of claims 1-11, wherein said zeolitic adsorbent has a pore occupancy comprised between 0.01 and 100%.

13. Method according to any of claims 1-12, whereby said mixture of alkanes is a mixture of linear, mono-branched and multi-branched alkanes.

14. Method according to claim 13, wherein said mixture comprises 0.1-99.9% linear, 0.1-99.9% mono-branched and 0.1-90% multi-branched alkanes.

15. Method according to any of claims 13-14, whereby said mixture of alkanes is a mixture of linear and mono-branched alkanes in a ratio comprised between 1:100 to 100:1.

16. Method according to claim 15, wherein said mixture comprises mono-branched and linear alkanes in a ratio of 1:1.

17. Method according to any of claims 1-16, wherein said separation is based on entropic effects.

5   18. Use of at least one adsorbent for separating mono-branched hydrocarbons, e.g. from a mixture of hydrocarbons.

19. Use of at least one adsorbent according to claim 18 for preferentially adsorbing mono-branched hydrocarbons from said mixture.

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20. Use according to claim 18 or 19, wherein said adsorbent is an adsorbent as defined in any of claims 5-12.

21. Use according to any of claims 18-20, wherein said mixture is a mixture as defined in
15   any of claims 13-16.

22. Use according to any of claims 18-21, wherein said separation is based on entropic effects.

20   23. Use of MCM22 as a zeolite having a catalytic and an adsorbent activity.